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MATERIAL SAFETY DATA SHEET

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Western Industrial Supply

SECTION I. MATERIAL DESCRIPTION

Copper Alloy Ingots, containing Copper, Tin, Lead, Zinc, Iron, Antimony, Nickel, Aluminum, Manganese, Silicon, and Niobium.

Other Designations: ALLOYS. (See enclosed Alloy Designation Table.)

C83450	C86400	C92200	C95200
C83600 - 115	C86500	C92300	C95300
C83800	C87300	C92400	C95400
C84400 - 123	C87500	C92500	C95410
C84500	C87600 - Hercules	C92600	C95500 - Alum Bronze "D"
C84800	C90300	C92700	C95800
C85200	C90500	C92900	C96200
C85400 - 404	C90700	C93200	C96400
C85700	C91100	C93400	C97300
C86200	C91300	C93700	C97400
C86300	C91600	C93800	C97600
			C97800
MONELS —			C99700
Compositions A, B(H), C, D(S), E, and F.			C99750

131 Contact Metal & 406 Yellow Brass

SECTION II. HAZARDOUS INGREDIENTS

	FUME THRESHOLD VALUES OSHA 8 HR TWA	ACGIH 8 HR TWA (TLV)
Copper	0.1 mg/m³	0.2 mg/m³
Tin	2 mg/m³	2 mg/m³
Lead	50 µg/m³	150 µg/m³
Zinc	5 mg/m³	5 mg/m³
Iron	5 mg/m³	5 mg/m³
Antimony	0.5 mg/m³	0.5 mg/m³
Nickel	1 mg/m³	1 mg/m³
Aluminum	10 mg/m³	10 mg/m³
Manganese	1 mg/m³	1 mg/m³
Silicon	10 mg/m³	10 mg/m³
Niobium	no established limit	no established limit

SECTION III. PHYSICAL DATA

Physical Form:	Solid
Boiling Point:	Not Applicable
Freeze-Melt Temperature:	Approximately 1500° - 2100°F (816° - 1149°C)
Vapor Pressure:	Not Applicable
Evaporation Rate:	Not Applicable
Specific Gravity:	7.5 - 9.0
Density:	Approximately .3 lb/inch³
Solubility in H_2O:	Not Applicable
Color:	Yellow to Red
Odor:	None

SECTION IV. FIRE AND EXPLOSION DATA

Flashpoint	Auto-Ignition Temperature	Flammability Limits In Air
Not Applicable	Not Applicable	Not Applicable

There are no fire or explosion hazards with these alloys in solid form. In case of fire use extinguishing agents appropriate for the surroundings or materials. In no case should any water be poured on the fire for fear of explosion of the molten metal if it comes in contact with water. Fire fighters should wear full protective clothing and, where conditions warrant, NIOSH approved self-contained breathing apparatus. See Sections V and VII.

SECTION V. HEALTH HAZARD DATA

The primary hazard associated with handling of these compositions is exposure to Copper, Lead and Zinc compounds when melting, pouring, cut-off, and grinding these alloys in a foundry. The work area should be carefully monitored to evaluate potential exposures to airborne metals contained in the alloys when they are handled.

SECTION VI. REACTIVITY DATA

TLV: See Section II

Primary Routes of Entry: Inhalation of dust or fumes.

Copper and Manganese: Under normal handling and use, exposure to the solid form of copper alloy presents few health hazards. Thermal cutting, melting, machining/grinding may produce fumes or dust containing the component elements and breathing these fumes or dust may present potentially significant health hazards. The exposure levels in Section II are relevant to fumes and dust. Fumes of copper and manganese may cause metal fume fever with flu-like symptoms, and copper may cause skin and hair discoloration, irritation of the upper respiratory tract, metallic taste in the mouth and nausea. Over-exposure to manganese fumes can cause chronic manganese poisoning. The central nervous system is the chief site of injury. Chronic manganese poisoning is not a fatal disease although it is extremely disabling.

Lead — Short-Term Exposure: Primary routes of entry are inhalation of dust or fumes and ingestion through contamination of hands or face. Lead is an accumulative poison. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains and decreasing appetite. The effects are reversible and complete recovery is possible. Inhalation of large amounts of lead may lead to seizures, coma and death.

Lead — Long-Term Exposure: Long-term exposure to lower levels can result in a buildup of lead in the body and more severe symptoms. These may include anemia, pale skin, a blue line at the gum margin, decreased handgrasp strength, abdominal pain, severe constipation, nausea, vomiting and paralysis of the wrist joint. Prolonged exposure may also result in kidney damage. If the nervous system is affected, usually due to high exposures, the resulting effects include severe headaches, convulsions, coma, delirium, and death. In non-fatal cases, recovery is slow and not always complete. Alcohol ingestion and physical exertion may bring on symptoms.

Iron and Tin: Chronic overexposure to iron oxide or tin fumes may cause an apparent benign pneumoconiosis. In the case of iron oxide, this is called siderosis and stannosis for tin exposure.

SECTION VI. REACTIVITY DATA (continued)

Nickel: Short-term exposure can cause lung irritation, shortness of breath, coughing and wheezing. Long-term exposure may result in impairment of sense of smell, chest pain, destruction of nasal tissue, and asthmatic lung disease. Allergic sensitivity may also develop. Nickel hase been identified as a potential cancer causing agent.

Zinc: Exposure to fumes may cause "Metal Fume Fever." Onset of symptoms may be delayed 4 to 12 hours. Symptoms include irritation of the nose, mouth and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin. These symptoms go away in 24 to 48 hours and leave no effect.

SECTION VII. SPILL OR LEAK PROCEDURES

Care should be taken that molten metal should be handled carefully during pouring. Since the temperature of molten copper alloys is over 2000°F, severe metal burns could occur.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Melters and pourers should wear NIOSH approved respiratory protection where PEL or threshold values are or may be exceeded. The selection of the appropriate respiratory protection (dust and fume respirator, supplied-air respirator, etc.) should be based upon the actual or potential airborne contaminants and their concentrations present.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

All melters should wear proper protective gloves and eye protection equipment. Ingots can be preheated to remove any moisture on the surface in order to avoid any splashing when charged into a molten bath.